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10/557,820	11/23/2005	Kwan Young Han	P2614US00	2544
58/027 7590 10/04/2010 H.C. PARK & ASSOCIATES, PLC 8500 LEESBURG PIKE SUITE 7500 VIENNA, VA 22182				
EXAMINER				
TRAN, TONY				
ART UNIT		PAPER NUMBER		
2894				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATENT@PARK-LAW.COM

Office Action Summary

Application No.

10/557,820

Applicant(s)

HAN ET AL.

Examiner

TONY TRAN

Art Unit

2894

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

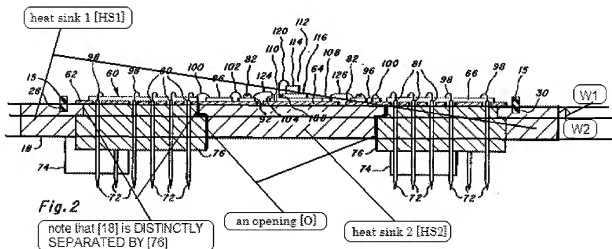
Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Carson (Patent No.: 4126882).



Re claim 1, Carson teaches a high power light emitting diode package (electro-optical device, col. 1, lines 5-10) comprising:

an insulation main body (76, Fig. 2, note that [76] is made of electrically insulating material, such as glass filled diallyl phthalate, col. 3, lines 32-36) having an opening to a bottom surface ([O], Fig. 2 [as shown above]);

at least two lead terminals (72, col. 3, lines 23-26) fixed to the main body (76);
and

at least two heat sinks ([HS1] & [HS2], note that as shown in Fig. 2, even though ([HS1] & [HS2]) is coming from [18], they are **distinctly separated** by the main body [76], **Fig. 12 [as shown above]**) therefore, they are considered as the two heat sinks) of electrically and thermally conductive metallic materials (([HS1] & [HS2])/[18], note that as it specifically said in col. 2, lines 65-67 that [18] is made of aluminum to provide a heat-sink), the heat sinks being separated from each other (by 76 as shown in Fig.2 above) and the at least two lead terminal (note that **[HS1] & [HS2] are separated** with the **two lead terminals [76s] by the insulation main body [76]**) and fixed to the main body (76), wherein a lower portion (bottom portion) of each of the at least two heat sinks ([HS1] & [HS2]) is exposed to the outside of the bottom surface of the main body (76) through the opening of the main body ([O]).

Re claim 2, Carson further teaches the package of claim 1, wherein each of the at least two heat sinks ([HS1] & [HS2]) has a reflective surface extended from an upper surface thereof (note that aluminum material had a reflective surface, col. 2, lines 65-67).

Re claim 3, Carson further teaches the package of claim 1, wherein the at least two heat sinks are a pair ([HS1] & [HS2]).

Re claim 4, Carson further teaches the package of claim 3, further comprising: at least one light emitting diode die (114, mounted on upper surfaces of the at least two heat sinks ([HS1] & [HS2]), the die being directly and electrically connected to the heat

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sinks through a surface of the die (note that substrate segment 62, 64 & 66 are made of alumina, die 114 is electrically connected to [62, 64 & 66], therefore, 114 being directly and electrically connected to ([HS1] & [HS2])).

Re claim 5, Carson further teaches the package of claim 4, further comprising: bonding wires (98, col. 4, lines 15-20) electrically connecting the at least two lead terminals (72), the at least two heat sinks ([HS1] & [HS2]) and the at least one light emitting diode die (114).

Re claim 16, Carson, Fig. 2 teaches a high power light emitting diode package comprising:

an insulation main body (76);

at least two lead terminals (72s) fixed to the main body (76);

at least two heat sinks ([HS1] & [HS2]) of electrically and thermally conductive materials (aluminum), the heat sinks being separated from each other and fixed to the main body (76), each of the at least two heat sinks having an upper surface ([US], Fig. 2 [as shown above]) and a lower surface [LS], the lower surface [LS] of each of the at least two heat sinks ([HS1] & [HS2]) being relatively wider ([W2] > [W1]) in vertical direction, **Fig. 2 [as shown above]**), note that Applicant did not claim which direction of the width) than the upper surface [US] of each of the at least two heat sinks ([HS1] & [HS2]); and

a light emitting diode die (114) mounted on one of the upper surfaces [US] of the heat sinks ([HS2]), the light emitting diode die (114) having a lower surface facing the upper surface of each of the at least two heat sinks ([HS1] & [HS2]),

wherein the upper surface [US] of each of the at least two heat sinks ([HS1] & [HS2]) is wider than the lower surface (bottom surface) of the light emitting diode die (114), so that the light emitting diode die (114) mounted partly (only small portion) on a portion of the heat sink ([HS2]).

Re claim 17, Carson further teaches the package of claim 1, wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum (note that [18] is made of aluminum, col. 2, lines 65-67).

Re claim 18, Carson further teaches the package of claim 16, wherein the at least two heat sinks each consist of either copper, gold, silver, or aluminum (note that [18] is made of aluminum, col. 2, lines 65-67).

Claim Rejections - 35 USC § 103

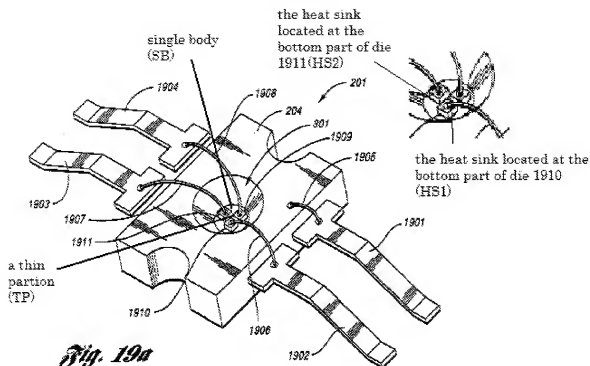
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10, 12-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (Patent No.: US 6335548) in view of Carson (Patent No.:

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4126882).



Re claim 1, Roberts, one embodiment, FIGS. 19A-19B teaches a high power light emitting diode package comprising:

an insulation main body (204, col. 29, lines 61-65, note that could be an alternatively of another high thermal conductivity material such as ceramic, col. 10, lines 1-6);

at least two lead terminals (1902 & 1903, col. 30, lines 5-10) fixed to the main body (204); and

at least two heat sinks (HS1 & HS2, FIG. 19a [as shown above], note that HS1 and HS2 are sitting on top of heat extraction 204 which are conducting heat to 204

therefore they are considering as the heat sinks) of electrically and thermally conductive materials, the heat sinks being separated from each other and fixed to the main body (204).

Roberts, one embodiment, FIGS. 19A-19B does not disclose a heat sink of electrically and thermally conductive metallic materials

Roberts, one embodiment, FIGS 5-6 does teach a heat sink of electrically and thermally conductive metallic materials (502, col. 16, lines 30-67)

It would have been obvious to one ordinary skill in the art at the time the invention was made to further including a heat sink of electrically and thermally conductive metallic materials in Roberts, one embodiment, FIGS. 19A-19B, as taught by Roberts, one embodiment, FIGS 5-6. One would have been motivate to make such a change to improve electrical characteristic and performance of light emitting device (Roberts, BACKGROUND ART).

Furthermore, after the combining of Roberts, one embodiment, FIGS. 19A-19B and Roberts, one embodiment, FIGS 5-6 would teach at least two heat sinks of electrically and thermally conductive metallic materials.

Moreover, Roberts et al., one embodiment, FIGS. 19A-B does not disclose wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body.

Carson, Fig. 2 teaches wherein a lower portion of each of the at least two heat sinks ([HS1] & [HS2]) is exposed to the outside of the bottom surface of the main body (76) through the opening of the main body ([O], Fig. 2 [as shown above]).

It would have been obvious to one ordinary skill in the art at the time the invention was made to further including wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body in (Roberts et al., one embodiment, FIGS. 19A-B) for the purpose of improving the heat dissipation for light emitting diode because of aluminum or alloy is a known material used for heat sink , as taught by Carson, Fig. 2, col. 2, lines 65-67.

Re claims 2-3, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 1, wherein each of the at least two heat sinks (HS1 & HS2) has a reflective surface (301, col. 30, lines 9-11 & col. 12, lines 10-15) extended from an upper surface thereof (claim 2).

wherein the at least two heat sinks are a pair (HS1 & HS2, FIG. 19a as shown above) (claim 3).

Re claim 4, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 3, further comprising: at least one light emitting diode die (top part of die 1910 or 1911) mounted on upper surfaces of the at least two heat sinks (HS1 & HS2), the die (1910 & 1911) being directly and electrically connected to the heat sinks (HS1 & HS2) through a surface of the die (top surface of 1910 & 1911).

Re claim 5, Roberts, one embodiment, FIGS. 19A-19B further teaches the package of claim 4, further comprising: bonding wires (1906 & 1907) electrically connecting the at least two lead terminals (1902 & 1903), the at least two heat sinks (HS1 & HS2) and the at least one light emitting diode die (1910 & 1911).

Re claim 6, Roberts, one embodiment, FIGS. 19A-19B further teaches package of claim 4, further comprising: a lens (401, col. 30, lines 9-10) attached to the main body (204), the lens (401) enclosing the at least one light emitting diode die (1910 & 1911).

Re claim 7, Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2 disclose all the limitation of claim 6 and Roberts, one embodiment, FIGS. 19A-B further discloses wherein the lens (401) includes at least one light emitting diode die (1910).

Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2 do not disclose includes an optically transparent material which is directly contacted with the at least one light emitting diode die.

Roberts, another embodiment, FIGS. 1-15 does teach includes an optically transparent material (501, FIG. 5, col. 17, lines 48-50) which is directly contacted with the at least one light emitting diode die (1910).

It would have been obvious to one ordinary skill in the art at the time the invention was made to further including includes an optically transparent material which is directly contacted with the at least one light emitting diode die in (Roberts, one embodiment, FIGS. 19A-B and Carson, Fig. 2), for the purpose of enhancing the light transmission as taught by (Roberts et al., another embodiment, FIGS. 1-15).

Re claim 8, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 4, further comprising: a fluorescent material converting the wavelength of light emitted from the at least one light emitting diode die (fluorescent dyes....within the encapsulant....re-emit it at lower wavelength, col. 24, lines 39-45, note that the encapsulant is the 203, FIG. 19B, col. 30, lines 8-10).

Re claim 9, Roberts et al., one embodiment, FIGS. 19A-B further teaches he package of claim 1, further comprising:

light emitting diode dies (top surface of 1910 & 1911) mounted on the respective heat sinks (HS1 & HS2), the light emitting diode dies emitting different wavelengths of light (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Re claim 10, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the at least two lead terminals (1902 & 1903) include:

lead terminals (1902 & 1903) electrically (connected to the at least two heat sinks (HS1 & HS2) respectively; and a common lead terminal electrically connected to all of the at least two heat sinks (the base (cathode) of the dies, the cup 301 and 204, col. 29, lines 61-67 and col. 30, lines 1-11, FIG. 9a).

Re claim 12, Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 9, wherein the light emitting diode dies include light emitting diode dies (1909, 1910, and 1911) emitting a first wavelength of light (red), a second wavelength of light (blue) and a third wavelength of light (green), respectively.

Re claim 13, Roberts et al., one embodiment, FIGS. 19A-B further teaches wherein the first wavelength, the second wavelength and the third wavelength are red wavelength, green wavelength and blue wavelength, respectively (the three dies 1909, 1910 and 1911 emit at red, blue, and green wavelengths respectively, col. 30, lines 13-14).

Re claim 15, the combining of Roberts et al., one embodiment, FIGS. 19A-B further teaches the package of claim 1, further comprising at least one septum (TP, Fig. 19a [as shown above]) formed in a single body (SB) along with the main body (204) to separate the at least two heat sinks (HS1 & HS2).

5. Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts/Carson as applied to claim 10 above and further in view of Pederson (Patent No.: US 6590343 B2).

Roberts and Carson disclose all the limitation of 10.

Moreover, Roberts, one embodiment, FIGS. 19A-B does not disclose the limitation as claims 11 and 14.

Pederson does teach an additional heat sink (346, FIG. 18, col. 14, lines 45-50); and a zener diode (614, FIG. 24, col. 18, lines 60-65) mounted on the additional heat sink (note that the zener diode is mounted on one of the opening 344, FIG. 18) (**claim 11**), and

a controller (50, FIG. 26, col. 12, lines 10-20) for controlling the electric power supplied to the light emitting diode package (608, 610, 612), wherein the controller controls the amount of the current supplied to the respective heat sinks (microcontroller 900 switches to decrease the current, see the ABSTRACT) (**claim 14**).

It would have been obvious to one ordinary skill in the art at the time the invention was made to include the above said teaching, as taught by Pederson. One would have been motivate to make such a change to optimize the performance of the

LED (Pederson, col. 1, lines 10-30), and inclusion of such would improve the photometric efficiency.

Response to Arguments

6. Applicant's arguments filed 07/26/10 have been fully considered but they are not persuasive.

In response to Applicant's argument "Carson teaches that a base structure 12 includes multiple retainer blocks 76 (Fig. 1d; col. 3, lines 22-26). Considering Carson's retainer blocks 76 as "an insulation main body" is not a reasonable interpretation of the claim language."

The examiner respectfully disagrees with Applicant because Carson teaches [76] is made of electrically insulating material, such as glass filled diallyl phthalate, col. 3, lines 32-36, therefore, [76] is read on the claim language such as an insulation main body.

In response to Applicant's argument "Second, Carson fails to teach "at least two heat sinks ... the heat sinks being separated from each other" as recited in claim 1. Carson discloses a plate 18 which is part of the base structure 12 (Fig. 1c; col. 3, line 18). Considering the plate 18 to be "at least two heat sinks" is not a reasonable interpretation of the claim language because a skilled artisan would not consider the single plate 18 as "two heat sinks". Even though there are openings in the plate 18 to accommodate the retainer blocks 76, a skilled artisan would consider the plate to be only a single heat sink, based on Carson's disclosure (see col. 2, lines 65-69: "base member plate 18 which may ... provide a heat sink")

The examiner respectfully submits that as shown in Fig. 2 above [18] is **DISTINCT SEPARATED** by [76], therefore, it is considered a the two SEPARATED HEAT SINKS ([HS1] & [HS2]).

In response to Applicant's argument "The Office Action fails to establish a *prima facie* case of obviousness of claim 1 at least because the examiner can not reasonably rely on Robert's dies 1910 and 1911 to teach the heat sinks of claim 1 (Office Action, page 8)."

The examiner respectfully submits that: The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
-
1. Roberts and Carson teach on the LED devices with attached heat sinks.
 2. Roberts et al., one embodiment, FIGS. 19A-B fails to teach the two heat sinks wherein a lower portion of each of the at least **two heat sinks** is exposed to the outside of the bottom surface of the main body through the opening of the main body.
 3. Carson, Fig. 2 teaches **the two heat sinks** wherein a lower portion of each of the at least two heat sinks ([HS1] & [HS2]) is exposed to the outside of the bottom surface of the main body (76) through the opening of the main body ([O], Fig. 2 [as shown above]).

4. It would have been obvious to one ordinary skill in the art at the time the invention was made to further including wherein a lower portion of each of the at least two heat sinks is exposed to the outside of the bottom surface of the main body through the opening of the main body in (Roberts et al., one embodiment, FIGS. 19A-B) for the purpose of improving the heat dissipation for light emitting diode because of aluminum or alloy is a known material used for heat sink, as taught by Carson, Fig. 2, col. 2, lines 65-67.

Therefore, the 4 steps had been establish and the condition as set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) had been met.

Therefore, the examiner considers the Carson and Roberts references are still read on the claims. For the above reasons, it is believed that the rejections should be sustained.

Conclusion

7. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY TRAN whose telephone number is (571)270-1749. The examiner can normally be reached on Monday through Friday: 7:30AM-5:00PM (E.S.T.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information Re the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony Tran/
Examiner, Art Unit 2894

/Kimberly D Nguyen/
Supervisory Patent Examiner, Art
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